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Chen

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(54) **COILABLE SHADE**

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E06B 9/42	(2006.01)
B60J 1/20	(2006.01)
E06B 9/90	(2006.01)
E06B 9/80	(2006.01)

(52) **U.S. Cl.**

CPC ... ***E06B 9/60*** (2013.01); ***E06B 9/42*** (2013.01); ***B60J 1/2033*** (2013.01); ***B60J 1/205*** (2013.01); ***E06B 9/90*** (2013.01); *E06B 2009/807* (2013.01)

(58) **Field of Classification Search**

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USPC 160/291–305, 313
See application file for complete search history.

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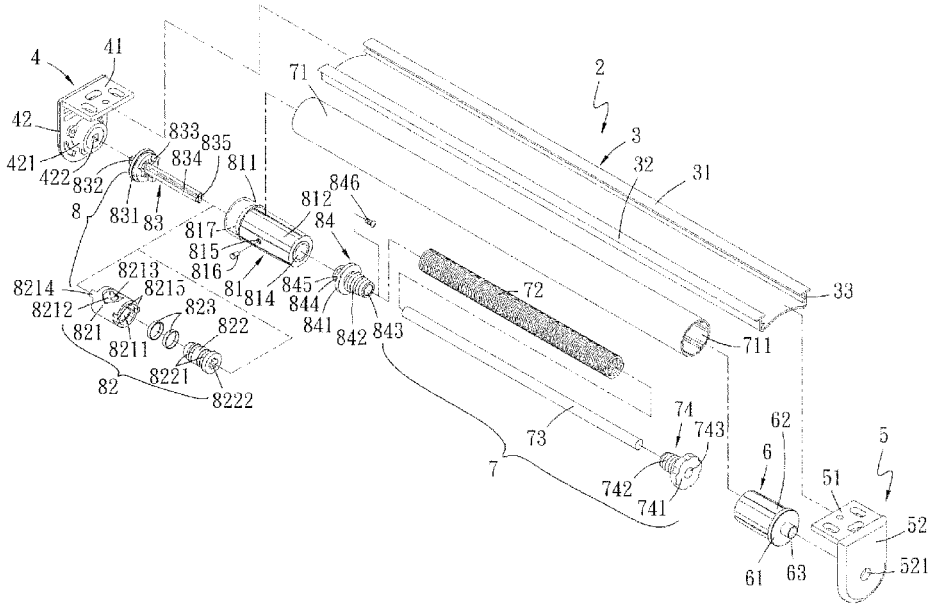
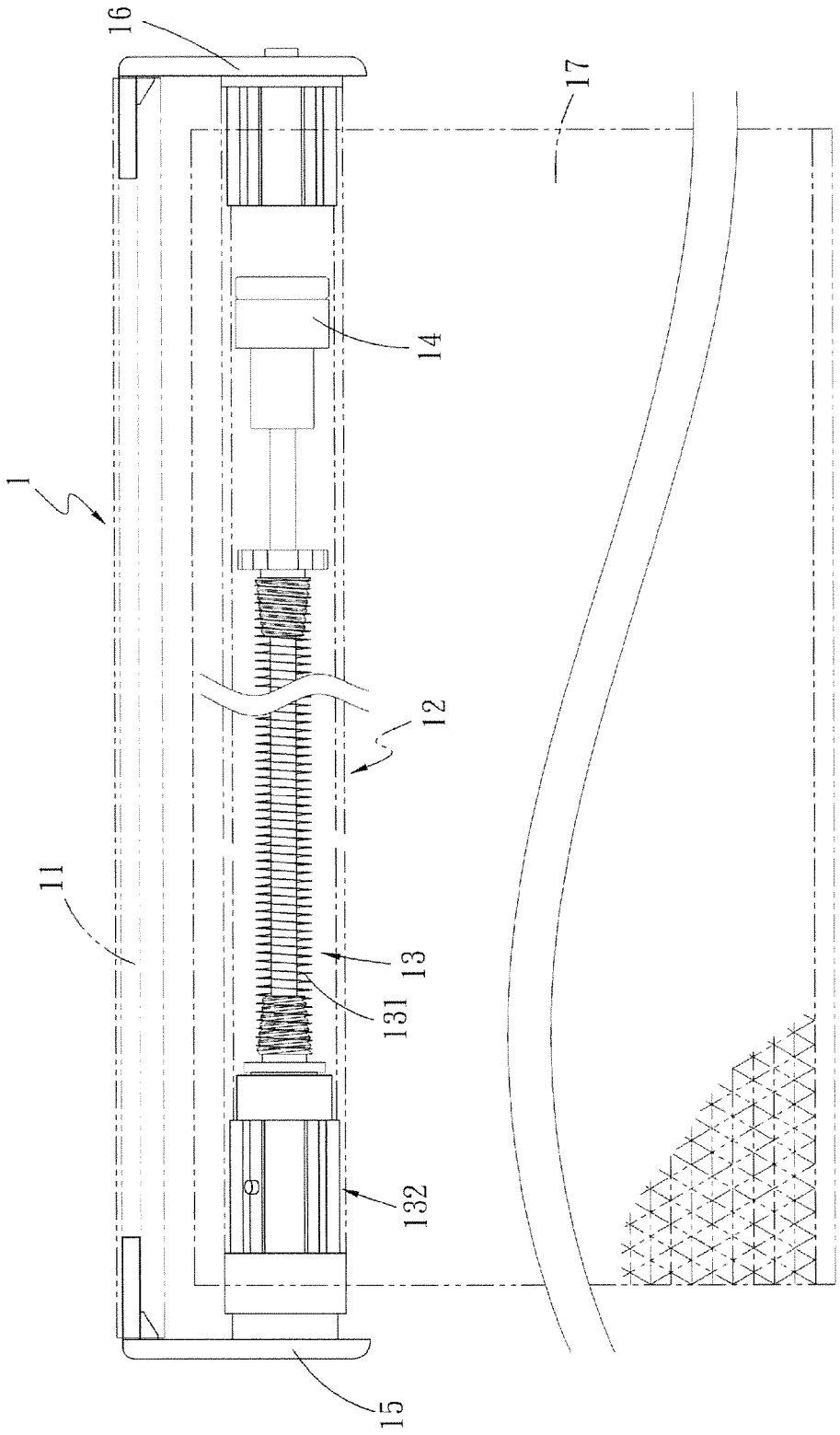
(57) **ABSTRACT**

A coilable shade includes a main frame to which left and right fixed seats are mounted. A drum is rotatably coupled to the right fixed seat and receives a spring receiving a shaft extending through a positioning seat. An end of the coiling spring is fixed to the positioning seat. The other end of the coiling spring is fixed to a connection seat mounted to the left fixed seat. A rotating unit is mounted in a jacket and rotatably coupled to a positioning rod fixed to the left fixed seat. A fastener is slideable along a track in a rotating member of the rotating unit to control unfolding, coiling, and positioning of a shade. The rotating unit further includes a sleeve received in the rotating member. A soft ring buffer is received in an annular groove of the sleeve and contacts an inner periphery of the rotating member.

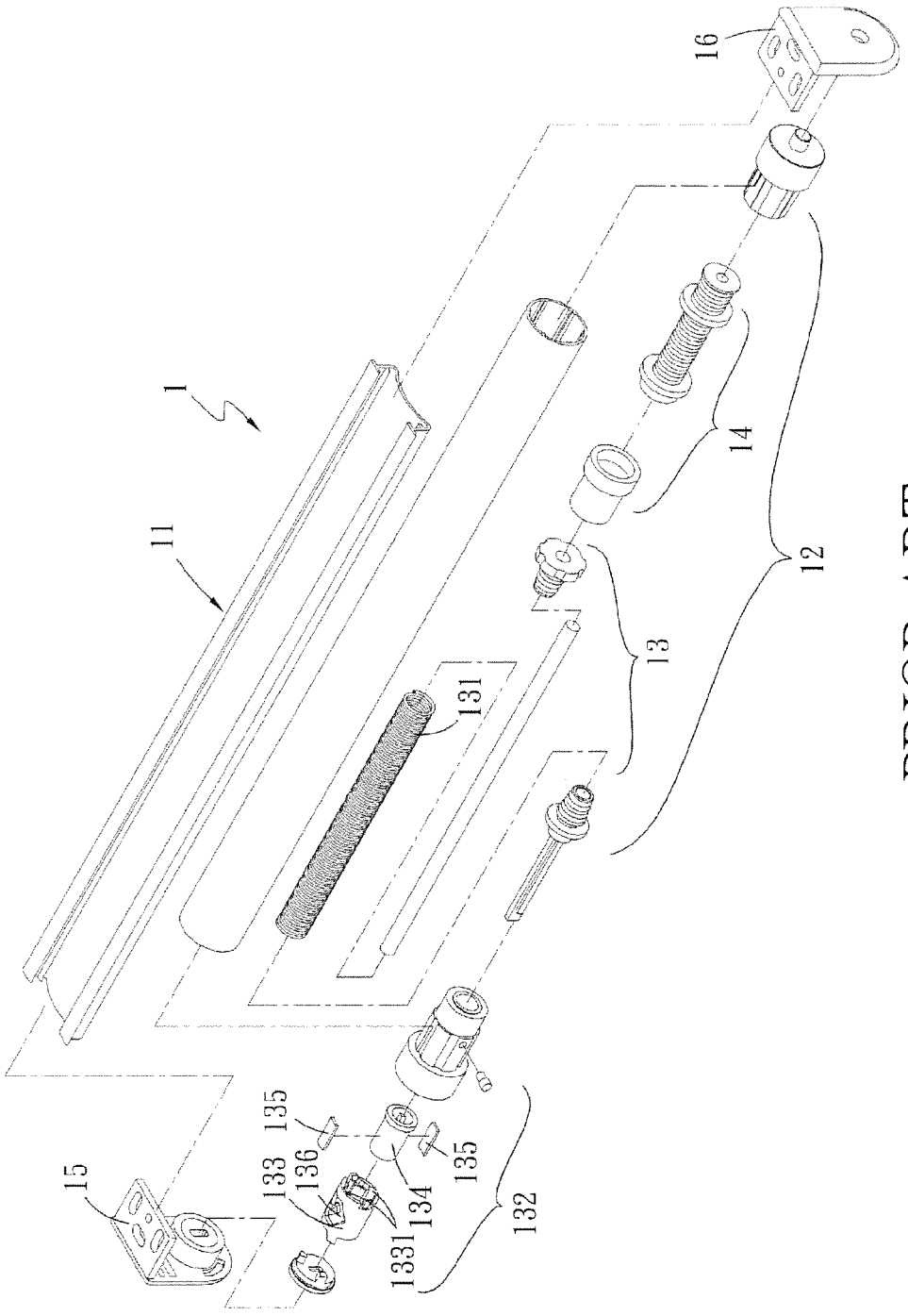
6 Claims, 7 Drawing Sheets





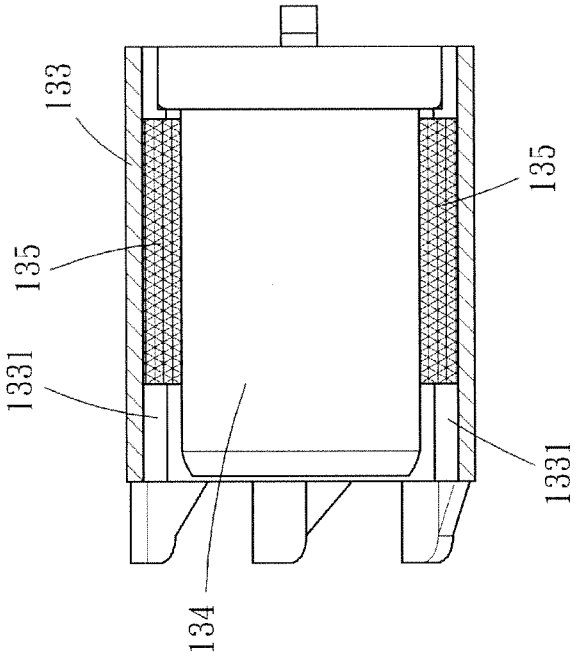
PRIOR ART

FIG.1



PRIOR ART

FIG.2



PRIOR ART
FIG.3

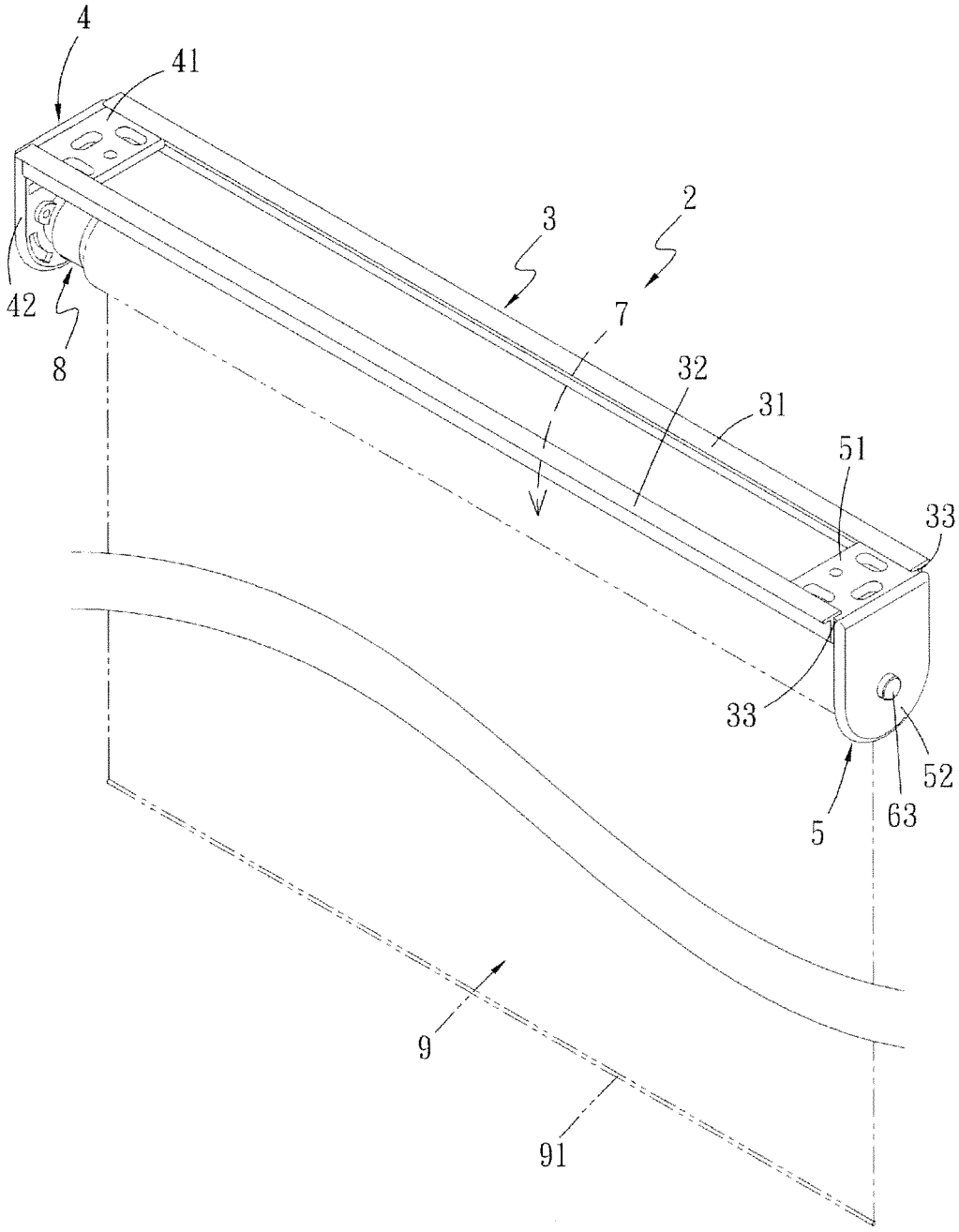


FIG.4

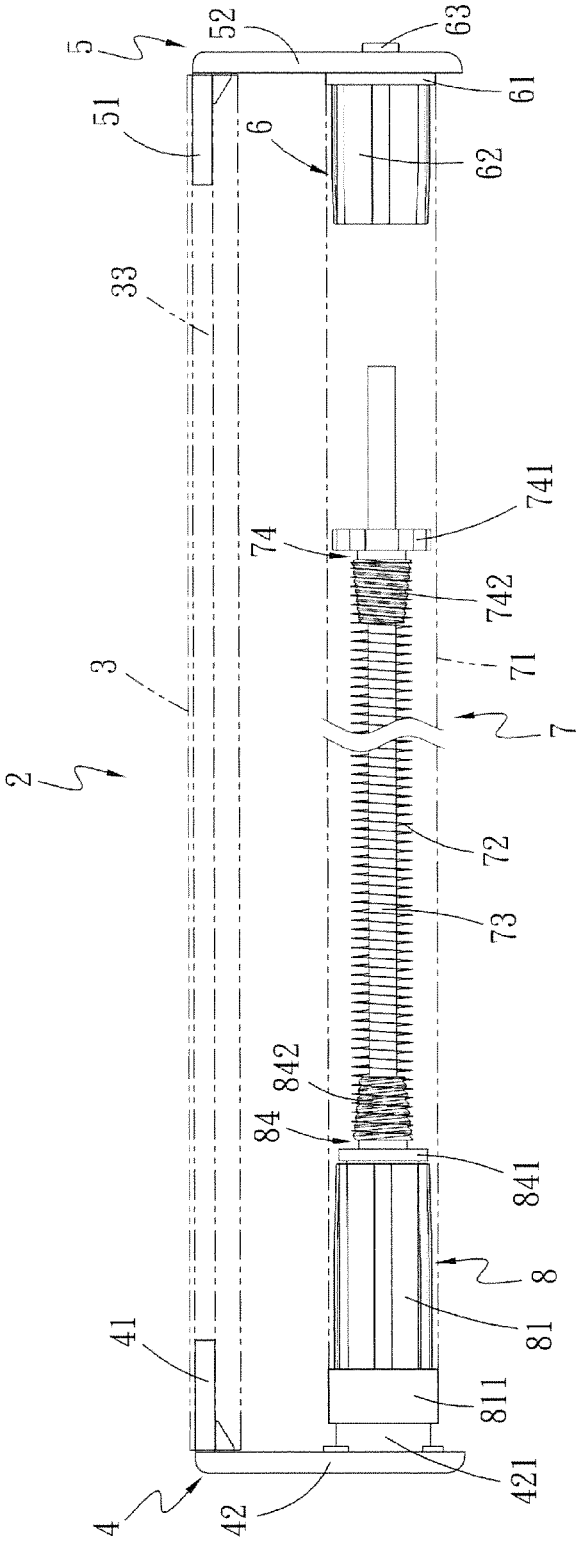

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FIG.5

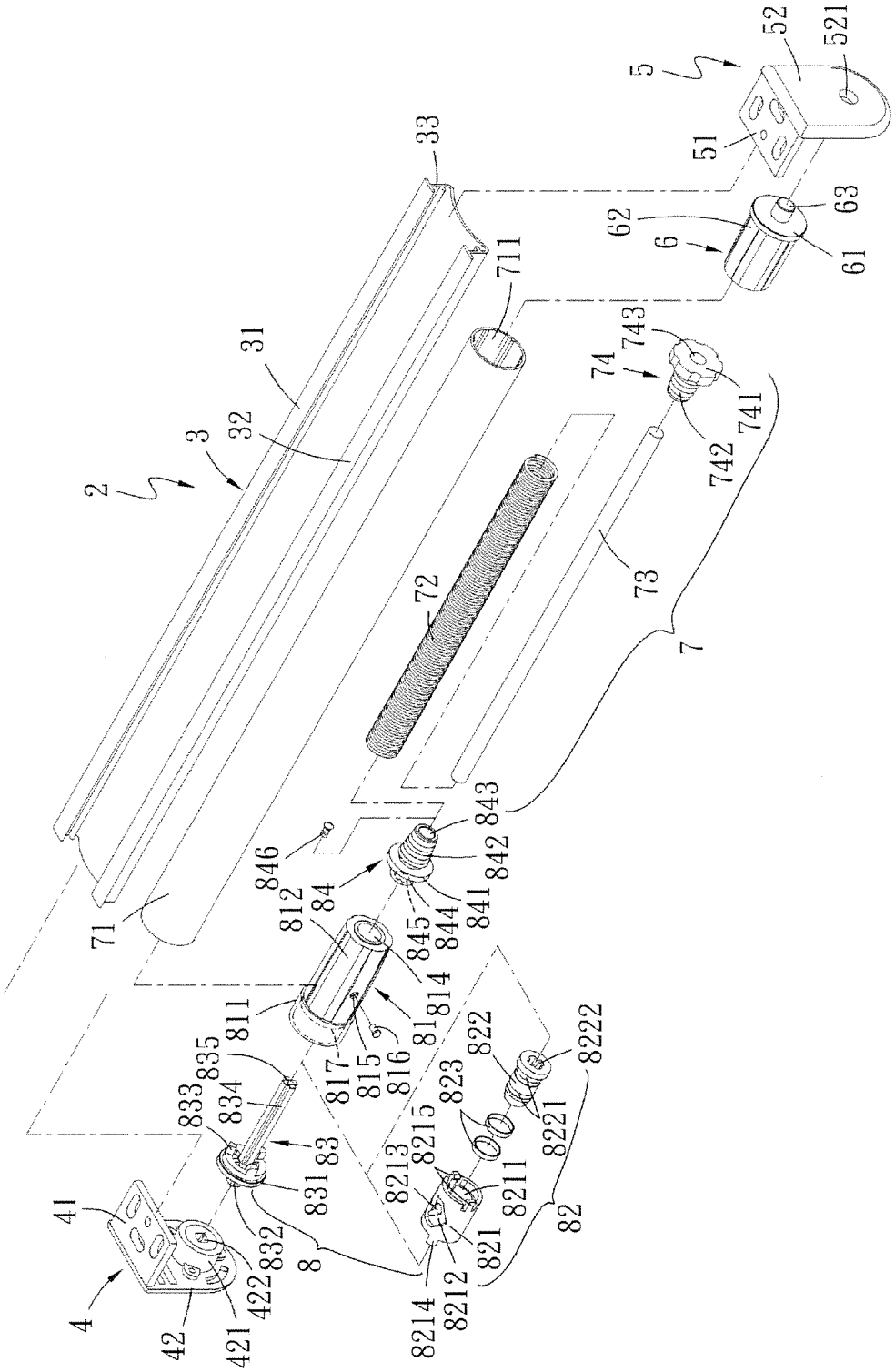
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FIG.6

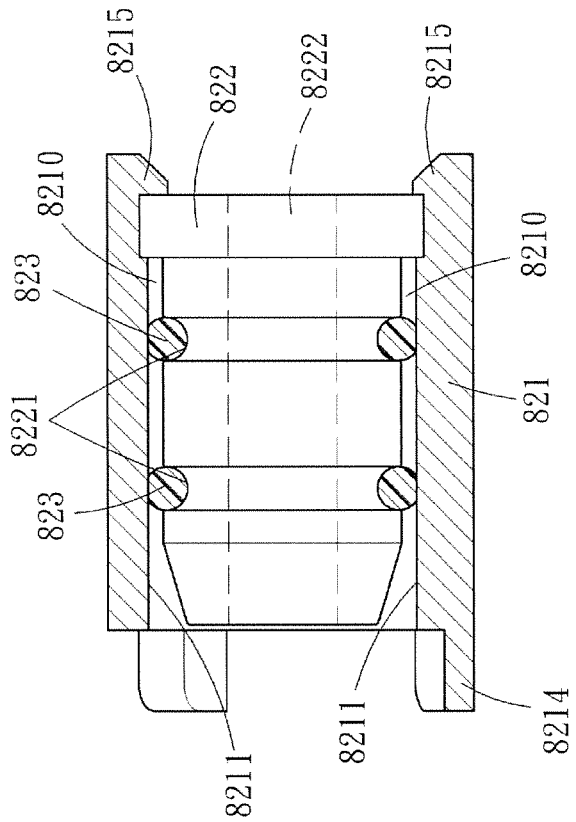

FIG.7

COILABLE SHADE

BACKGROUND OF THE INVENTION

The present invention relates to a coilable shade and, more particularly, to a coilable shade including a soft ring rubber to drive a rotating member to change a position of a track in the rotating member for controlling unfolding, coiling, and positioning of a shade as well as increasing the rotational frictional force of the rotating member and providing the buffering effect while coiling the shade.

A plurality of types of coilable shades available in the market is generally used on doors and windows in houses and offices to shield the sun as well as providing a decoration effect. FIGS. **1-3** show a conventional coilable shade **1** including a main frame **11**, a coiling device **12**, a pull/coil device **13** mounted to a left side of the main frame **11**, a hydraulic buffering device **14** mounted to a right side of the main frame **11**, and left and right fixed seats **15** and **16**. In a case that the shade **17** is moved downward to a position, a coiling spring **131** at a side of the pull/coil device **13** is tensioned and IS rotates freely. If the exposed portion of the shade **17** is insufficient, the shade **17** is pulled downward again to cause coiling of the shade **17**, wherein the coiling spring **131** is moved from the tensioned state to a stretched state and rotates together with the shade **17** to drive a rotating device **132** in the pull/coil device **13**. The rotating device **132** includes a rotating member **133** and a sleeve **134**. Two friction pads **135** made of wool felt are mounted between the rotating member **133** and the sleeve **134** and spaced from each other. If the frictional force of the friction pads **135** is insufficient, the shade **17** coils rapidly and causes noise. The hydraulic buffering device **14** reduces the coiling speed of the shade **17**. providing a buffering effect.

However, the coilable shade **1** has the following disadvantages while coiling the shade **17**:

(1) The friction pads **135** of the pull/coil device **13** provide insufficient friction such that the friction pads **135** can not easily drive the rotating member **133** to change the position of a track **136** on the rotating member **133**, failing to provide reliable coiling or uncoiling of the shade **17**.

(2) The friction pads **135** are received in recesses **1331** in an inner periphery of the rotating member **133**, and the sleeve **134** is then inserted into the rotating member **133** so that the outer periphery of the sleeve **134** contacts with the friction pads **135**. The overall diameter of the pull/coil device **13** is 3 cm, which is too large to be used in a small shade mounted to a door of an automobile, providing limited application.

(3) The hydraulic buffering device **14** is a necessity to the coilable shade I for buffering the shade **17**, increasing the costs.

BRIEF SUMMARY OF THE INVENTION

An objective of the present invention is to provide a coilable shade to mitigate and/or obviate the above disadvantages including rapid coiling of the shade, large volume, and high costs resulting from insufficient frictional force of frictional pads that fails to position the shade in a desired location and resulting from the hydraulic buffering device required for buffering the shade.

The above objective is fulfilled by a coilable shade according to the present invention including a main frame having left and right sides. A left fixed seat is mounted to the left side of the main frame. A right fixed seat is mounted to the right side of the main frame. A cap is rotatably mounted to the right fixed seat. A coiling device includes a drum having an end in which the cap is securely mounted, a spring received in the drum and including a first end and a second end, a shaft extending through the spring and including a first end and a second end, and a positioning seat. The first end of the shaft extends through the positioning seat. The first end of the coiling spring is fixed to the positioning seat. A control device is mounted to the left fixed seat. The second end of the coiling spring is fixed to the control device. The control device is received in the drum. A shade is coilable around the drum of the coiling device.

The control device includes a jacket, a rotating unit mounted in an end of the jacket, a positioning rod rotatably coupled to the rotating unit and fixed to the left fixed seat, and a connecting seat mounted in the other end of the jacket. The shaft extends through the connecting seat. The other end of the jacket engages with a side of the coiling device. A fastener extends through an outer periphery of the jacket. The rotating unit includes a rotating member having a track and a guiding block in the track. The fastener is slideable along the track to control movement of the rotating member to control unfolding, coiling, and positioning of the shade. The rotating unit further includes a sleeve received in the rotating member. The sleeve includes an outer periphery having at least one annular groove. At least one soft ring buffer is received in the at least one annular groove and contacts an inner periphery of the rotating member.

The at least one soft ring buffer of the control device according to the present invention can drive the rotating member to change the position of the track for unfolding, coiling, and positioning of the shade. Furthermore, the rotational friction force of the rotating member and the buffering effect during coiling of the shade can be increased, allowing easy operation and easy adjustment.

The overall outer diameter of the control device according to the present invention is as small as 1.5 cm after assembly, which is not only suitable for coilable shades on doors and windows but also suitable for small shades used on doors of automobiles, providing a wider application.

The present invention will become clearer in light of the following detailed description of illustrative embodiments of this invention described in connection with the drawings.

DESCRIPTION OF THE DRAWINGS

FIG. **1** is a front view of a coilable shade, with a portion of the coilable shade removed to show components in a main frame of the coilable shade.

FIG. **2** is an exploded, perspective view of the main frame and the components in the main frame of the coilable shade of FIG. **1**.

FIG. **3** is a cross sectional view of a rotating device of FIG. **2**.

FIG. **4** is a perspective view of a coilable shade according to the present invention.

FIG. **5** is a front view of the coilable shade of FIG. **4**.

FIG. **6** is an exploded, perspective view of the coilable shade of FIG. **4**.

FIG. **7** is a cross sectional view of a rotating device of the coilable shade of FIG. **4**.

DETAILED DESCRIPTION OF THE INVENTION

With reference to FIGS. **4-7**, a coilable shade **2** according to the present invention includes a main frame **3** having two upwardly extending abutment sides **31** and **32**, with the abut-

ment sides **31** and **32** opposite to each other. A channel **33** is defined between two inner faces of the abutment sides **31** and **32**.

The coilable shade **2** further includes left and right fixed seats **4** and **5** opposite to each other and respectively mounted to left and right sides of the main frame **3**. The left fixed seat **4** includes a left fixed board **41** and a left positioning board **42** extending downward from an outer end of the left fixed board **41**. The right fixed seat **5** includes a right fixed board **51** and a right positioning board **52** extending downward from an outer end of the right fixed board **51**. The left and right fixed boards **41** and **51** are inserted into the channel **33** defined between the abutment sides **31** and **32** of the main frame **3**. Each of the left and right fixed boards **41** and **51** has a plurality of fixing holes. Fasteners extend through the fixing holes into a wall face. A protrusion **421** is formed on an inner face of the left positioning board **41** and has a square axle hole **422**. A hole **521** is defined in the right positioning board **52** and aligned with the square axle hole **422**.

The coilable shade **2** further includes a cap **6** is rotatably mounted to the right fixed seat **5**. The cap **6** includes a stop face **61**. A bulge extends from a side of the stop face **61**. An axle **63** protrudes from the other side of the stop face **61** facing the hole **521** of the right positioning board **52**. The axle **63** is rotatably received in the hole **521**.

The coilable shade **2** further includes a coiling device **7** having a drum **71**, a coiling spring **72**, a shaft **73**, and a positioning seat **74**. The drum **71** has a hollow interior **711**. The bulge **62** of the cap **6** is securely engaged in an end of the drum **71**. The coiling spring **72** is received in the hollow interior **711** of the drum **71**. The shaft **73** extends through an interior of the coiling spring **72**. The positioning seat **74** includes a right stop **741** having a side from which a right threaded portion **742** protrudes. An end of the coiling spring **72** is securely mounted around the right threaded portion **742**. The right threaded portion **742** has a right axle hole **743** through which an end of the shaft **73** extends. Thus, coiling spring **72** can be stretched or returned by the end of the shaft **73**.

The coilable shade **2** further includes a control device **8** fixed to the left fixed seat **4** and coupled to the coupling device **7**. The control device **8** includes a jacket **81**, a rotating unit **82** mounted in an end of the jacket **81**, a positioning rod **83** rotatably coupled to the rotating unit **82**, and a connecting seat **84** mounted in the other end of the jacket **81**. The jacket **81** includes a stop portion **811** having a side facing the drum **71**. An engagement portion **812** protrudes from the side of the stop portion **811** and is securely engaged in the hollow interior **711** of the drum **71**. The engagement portion **812** includes a through-hole **814** in an end thereof. The engagement portion **812** further includes a screw hole **815** through which a fastener **816** extends, with the fastener **816** serving as a guiding rod. The jacket **81** further includes a receiving space **817** facing the rotating unit **82** and the protrusion **421** of the left positioning board **42**.

The rotating unit **82** includes a rotating member **821**, a sleeve **822**, and at least one soft ring buffer **823**. The rotating member **821** includes a through-hole **8211** therein. The rotating member **821** further includes a track **8212** in an outer periphery thereof and a guiding block **8213** in the track **8212**. The fastener **816** is slideable along the track **8212** to control movement of the rotating member **821** upon movement of the shade **9**, thereby controlling unfolding, coiling and positioning of the shade **9**. A side of the rotating member **821** facing the left fixed board **42** includes a plurality of projections **8214**. The other side of the rotating member **821** facing an interior of the sleeve **81** includes two pressing blocks **8215**. After the sleeve **822** is mounted in the through-hole **8211** of the rotating member **821**, the pressing blocks **8215** press against the sleeve **822** and prevent the sleeve **822** from disengaging from the rotating member **821**. The sleeve **822** includes at least one annular groove **8221** in an outer periphery thereof, with a gap **8210** defined between the outer periphery of the sleeve **822** and an inner periphery of the through-hole **8211** of the rotating member **821**. In this embodiment, the sleeve **822** includes two annular grooves **8221**, and the sleeve **822** has an axial hole **8222**. Two soft ring buffers **823** are respectively received in the annular grooves **8221**. Each soft ring buffer **823** has an outer diameter larger than an inner diameter of the rotating member **821** such that the soft ring buffer **823** pressing against the inner periphery of the through-hole **8211**. Each soft ring buffer **823** can be made of silicon rubber to increase the friction force and heat resisting effect of the rotating member **821**, which can be used to replace the buffering effect of the buffering device in conventional coilable shades.

The positioning rod **83** includes a circular stop **831** received in the receiving space **817** of the sleeve **81**. A side of the circular stop **831** facing the square axle hole **422** includes an axle **832** having a shape corresponding to the square axle hole **422**. The other side of the circular stop **831** facing the rotating member **821** includes a plurality of projections **833** for engaging with the projections **8214** for positioning purposes. A spindle **834** protrudes from the other side of the circular stop **831** and has a shape corresponding to the axial hole of the sleeve and the coupling hole of the connecting seat. The spindle **834** has a screw hole **835** in an end thereof.

The connecting seat **84** includes a left stop **841**. A left threaded portion **842** protrudes from a side of the left stop **841**. The other end of the coiling spring **72** is securely mounted around the left threaded portion **842**. The left threaded portion **842** includes a left axle hole **843**. The other end of the shaft **73** extends through and engages in the left axle hole **843**. A coupling section **844** protrudes from the other side of the left stop **841** and includes a coupling hole **845** aligned with the left axle hole **843**. The spindle **834** extends through the axial hole **8222** of the sleeve **822** and is fixed in the coupling hole **845** of the connecting seat **84**. A crew **846** extends through the left axle hole **843** and is threadedly engaged in the screw hole **835**.

A shade **9** includes an end coiled around the outer periphery of the drum **71**. A pull rod **91** is fixed to the other end of the shade **9**.

After assembling the above components to form the coilable shade **2**, when the pull rod **91** is manually pulled downward for a short period of time, if the shade **9** is unfolded in the clockwise direction, the coiling spring **72** of the coiling device **7** coupled to the control device **8** is stretched outward and rotates freely around the shaft **73**. The rotating force of the coiling spring **72** is smaller than the frictional force of the soft ring buffers **823** such that the shade **9** is unfolded smoothly. If it is desired to coil the shade **9** by rotation in the counterclockwise direction, the coiling spring **72** of the coiling device **7** is tensioned and drives the rotating unit **82** of the control device **9** to rotate jointly. Due to provision of the soft ring buffers **823** made of silicon rubber and mounted between the sleeve **822** and the rotating member **821**, when the rotating unit **82** rotates in the counterclockwise direction, the soft ring buffers **823** drives the rotating member **821** to change the position of the track **8212** to achieve unfolding, coiling, and positioning of the shade **9**. This also provides a buffering effect to rotation of the rotating member **821** and coiling of

the shade **9**, which can be used to replace the buffering effect provided by the hydraulic buffering device in conventional coilable shades.

The overall outer diameter of the control device **8** of the coilable shade **12** according to the present invention can be as small as 1.5 cm after assembly, which is not only suitable for coilable shades on doors and windows but also suitable for small shades used on doors of automobiles, providing a wider application.

In view of the foregoing, the coilable shade **12** according to the present invention can easily be operated and can be retained in any desired position, providing improvements over the conventional coilable shades.

Although specific embodiments have been illustrated and described, numerous modifications and variations are still possible without departing from the scope of the invention. The scope of the invention is limited by the accompanying claims.

The invention claimed is:

1. A coilable shade comprising:

a main frame having left and right sides;

a left fixed seat mounted to the left side of the main frame;

a right fixed seat mounted to the right side of the main frame, a cap rotatably mounted to the right fixed seat;

a coiling device including:

a drum, with the cap securely mounted in an end of the drum;

a spring received in the drum and including a first end and a second end;

a shaft extending through the spring and including a first end and a second end; and

a positioning seat, the first end of the shaft extending through the positioning seat, the first end of the spring fixed to the positioning seat;

a control device mounted to the left fixed seat, the second end of the coiling spring fixed to the control device, the control device received in the drum; and

a shade coilable around the drum of the coiling device,

wherein the control device includes a jacket, a rotating unit mounted in an end of the jacket, a positioning rod rotatably coupled to the rotating unit and fixed to the left fixed seat, and a connecting seat mounted in another end of the jacket, the shaft extending through the connecting seat, the other end of the jacket engaged with a side of the coiling device, a fastener extending through an outer periphery of the jacket,

the rotating unit including a rotating member having a track and a guiding block in the track, the fastener being slideable along the track to control movement of the rotating member to control unfolding, coiling, and positioning of the shade,

the rotating unit further including a sleeve received in the rotating member, the sleeve including an outer periphery having at least one annular groove formed to extend continuously thereabout,

at least one soft ring buffer received in the at least one annular groove to remain annularly captured between the sleeve and an inner periphery of the rotating member.

2. The coilable shade as claimed in claim **1**, wherein the jacket includes a stop portion having a side facing the drum, an engagement portion protruding from the side of the stop portion and securely engaged in the drum, and a receiving space, receiving the rotating unit and the left fixed board.

3. The coilable shade as claimed in claim **2**, wherein the at least one soft ring buffer is made of silicon rubber and matched with the at least one annular groove.

4. The coilable shade as claimed in claim **3**, wherein a gap is formed between the outer periphery of the sleeve and the inner periphery of the rotating member, the gap allowing insertion of the at least one soft ring buffer.

5. The coilable shade as claimed in claim **4**, wherein the at least one soft ring buffer has an outer diameter larger than an inner diameter of the inner periphery of the rotating member.

6. The coilable shade as claimed in claim **5**, wherein the sleeve includes an axial hole, the left fixed board including a protrusion having a square axle hole, the connecting seat including a left stop, a left threaded portion protruding from a side of the left stop, the second end of the coiling spring securely mounted around the left threaded portion, the left threaded portion having a left axle hole, the second end of the shaft engaged in the left axle hole, a coupling section protruding from another side of the left stop and including a coupling hole aligned with the left axle hole, the positioning rod including a circular stop, an axle formed on a side of the circular stop and having a shape corresponding to the square axle hole, a spindle protruding from another side of the circular stop, the spindle having a shape corresponding to the axial hole of the sleeve and the coupling hole of the connecting seat, the spindle having a screw hole in an end thereof, a screw extending through the screw hole to connect the connecting seat with the spindle.

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